

What Can be Done to Improve Progress?

Quick as my Thought
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Age 8
Submitted Independently
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This last section summarizes ideas and actions to improve watershed management from roundtable participants, reinvention team members, academic evaluators, and government-sponsored studies and reports. The section organizes these recommendations with the same seven themes used by the previous section. Implementation of these recommendations will require the collaboration of diverse stakeholders in the public and private sectors. A more detailed discussion of potential actions follows each set of recommendations.

Education and Awareness

Recommendations

Ensure that key groups receive environmental education:

- Local decision-makers, such as municipal officials, mayors, and county councilpersons
- Students
- Real estate, agricultural, and industrial organizations

Use modern technology and multi-media campaigns to enhance education and awareness programs

Discussion

As noted in the fourth section of this report, most Americans do not understand how watershed health is threatened and degraded. Many others do not under-



stand how they can improve watershed health. As a result, the collective actions of individuals significantly impair our nation's water resources.

Education and awareness efforts should build on previous successes. Many programs attempt to reach a broad audience, but education and awareness programs should give special attention to a few key groups. Education and awareness programs should target local decision-makers because they can change local land use policies. Watershed groups should develop peer education programs for agricultural stakeholders, real estate developers, and industrial organizations because these programs have proven to be effective.

Student education programs are a long-term investment in an environmentally aware citizenry. State and federal agencies should expand efforts to encourage use of environmental curricula; many excellent and proven curricula are rarely used. Teachers need training, and schools should consider flexible, interdisciplinary learning approaches. Studies suggest that thematic, action-oriented environmental education can improve academic achievement in many subjects, reduce discipline problems, and motivate students.

Education programs should continue to use modern technology. The Watershed Information Network organizes information about watershed resources in one location on the internet. Its sponsors are expanding the network and improving the accuracy and comprehensiveness of the information presented. Watershed education campaigns should increase their use of computer imaging technology. For example, television weather reports can use watershed maps to depict floods and droughts, and related features can demonstrate how common activities such as fertilizing a lawn impact watershed health (highlighted in this section). These types of projects can expand public awareness of how watersheds function.

USING MODERN TECHNOLOGY DURING WEATHER REPORTS

The National Environmental Education and Training Foundation hopes to advance public awareness of watershed issues through television weather reports. It is anticipated that in 2001 the weather report on WRC-TV NBC4 in Washington, DC will depict events such as oil spills, plumes of polluted runoff, floods, and droughts with three-dimensional maps of the Chesapeake Bay and Potomac River watersheds. An accompanying website will link viewers to real-time water quality monitoring data, volunteer monitoring data, and tips on reducing water pollution. If the program is successful, the National Environmental Education and Training Foundation will reproduce it in major cities around the country.

Partnerships and Coordination

Recommendations

Continue to develop broad partnerships for watershed protection and restoration:

- Enhance university-based service-learning networks to connect students and educators with local watershed groups

Foster greater coordination of government agencies for watershed protection and restoration:

- Implement the Unified Federal Policy
- Continue to facilitate government assistance to state, tribal, and local watershed practitioners with Federal Coordination Teams

Improve the delivery of information and support to local watershed efforts:

- Establish points of contact for federal, tribal, and state agencies
- Expand and enhance the Watershed Information Network
- Convene a federal-level workgroup to discuss further opportunities for improvement



Discussion

The nation has supported many watershed partnerships in recent years. And yet, because governments have traditionally divided watershed management responsibilities, partnership and coordination efforts may still provide the greatest opportunities for improvements to watershed management.

Many stakeholders participate in local watershed efforts, and state and federal governments should continue to encourage and support these partnerships. Universities can play a larger role in watershed management efforts. Academic institutions should assist watershed efforts with relevant research, monitoring, assessment, planning, priority-setting, implementation, and education programs. Federal agencies should support service-learning networks that link skilled students and faculty with watershed groups.

Government coordination efforts should build on recent successes. Federal Coordination Teams should continue to integrate government funding and technical assistance programs and to support the implementation of these programs by local watershed practitioners. The Unified Federal Policy on Watershed Management should promote a consistent, cost-effective watershed approach for federal land and resource management. Agencies should continue model programs such as the Five-Star Restoration Program.

Many watershed practitioners note that government agencies can improve the delivery of informational, technical, and financial support to watershed efforts. Individual government agencies should designate reliable, responsive, and knowledgeable points of contact to answer questions and support watershed management. Government agencies should coordinate information about water quality data, technical assistance, and financial assistance in one location. The Watershed Information Network supports this goal; its sponsors are updating this network to address all of these issues. Federal agency representatives suggest that a federal-level workgroup could consider further coordinating federal support for watershed efforts.

Senior career personnel that manage watershed issues would participate in the workgroup. The workgroup would develop strategies to promote mutual understanding of programs and policies, to identify and resolve inter-agency inconsistencies or misunderstandings, and to implement actions (such as memoranda of understanding) that foster and support coordination at regional, state, tribal, and local levels.

Monitoring and Research

Recommendations

Increase coordination of watershed monitoring programs:

- Develop a national watershed monitoring network to consider trends in watershed health
- Increase coordination among federal, tribal, state, and local governments and volunteer monitoring groups to ensure that volunteer data are accurate, complete, and compatible with government monitoring efforts
- Implement the Coastal Research and Monitoring Strategy recommendations

Incorporate new indicators into watershed monitoring programs:

- Monitor physical and biological characteristics
- Monitor emerging chemical contaminants such as pharmaceuticals and endocrine disruptors

Provide meaningful and timely watershed information to decision-makers and the public:

- Provide data at scales useful for decision-making
- Use the internet to display and distribute visual, understandable data

Expand research in watershed management:

- Explore linkages among watershed components—rivers, wetlands, floodplains, upland areas, groundwater, and the atmosphere
- Explore the integration of the natural and social sciences
- Improve and verify models that can predict watershed properties



Increase research efforts that evaluate environmental outcomes, such as research that evaluates best management practices

Discussion

Monitoring and research direct watershed protection and restoration activities. Many watershed monitoring and research programs operate at local, state, tribal, and federal levels. Increasingly, volunteers and nonprofit organizations are also collecting and analyzing watershed indicators.

Watershed monitoring programs lack consistency and comprehensiveness. The federal government should develop a national watershed monitoring program with standard protocols. This program should be coordinated with monitoring programs run by tribal, state, and local governments, as well as with volunteer groups. A consistent national program would reveal trends in watershed health. These coordinated sources of watershed monitoring data should provide information that the federal government can use at larger scales to make national policy decisions, and local watershed decision-makers can use for smaller-scale assessments.

Watershed monitoring programs should incorporate resource indicators that have not been traditionally measured. Monitoring programs should consider physical characteristics, such as wetland structure and streambank stability, and emerging chemical contaminants, such as pharmaceuticals. The federal government should continue to develop and disseminate wetlands tracking and assessment tools. Monitoring programs should incorporate biological indicators of watershed health, such as species diversity and population levels. These programs should also monitor previously neglected areas. For example, federal agencies with coastal responsibilities should lead the implementation of the “Coastal Research and Monitoring Strategy” to address deficiencies in coastal zone monitoring. Watershed management efforts need nationally consistent monitoring programs that cover a variety of watershed resources.

Watershed monitoring programs should provide timely data to the public. The data should be easily accessible

and understandable. Monitoring programs should use the internet to display and transfer large volumes of data.

Research programs should study linkages in watershed function. Researchers should investigate the linkages between watershed components—rivers, wetlands, floodplains, upland areas, groundwater, and the atmosphere. Researchers should also investigate linkages of natural sciences, such as biology, chemistry, and physics, with social sciences, such as economics, sociology, and psychology. For example, watershed actions that protect lands, reduce pollution, or manage species can profoundly affect individual and community attitudes and economics.

Researchers should also develop models that are more accurate and more reliable. For example, watershed models are needed to predict pollutant inputs or pollutant movement in watersheds. These models would reduce monitoring costs and suggest watershed protection and restoration actions.

Perhaps most importantly, research efforts should investigate the long-term successes and failures of protection and restoration activities. Researchers should investigate why similar actions cause different results in different watershed situations. This research would be invaluable in guiding future watershed projects.

Planning and Prioritization


Recommendations

Encourage consideration of watershed health in local planning:

- Provide incentives for ecologically sensitive planning activities

Refine and coordinate national watershed assessments:

- Provide incentives to prioritize actions within watersheds at a smaller scale
- Coordinate federal assistance (financial and technical) across programs to maximize improvement opportunities
- Integrate new and enhanced monitoring and assessment data into planning and prioritization activities



Discussion

Watershed stakeholders should organize and integrate watershed activities to ensure that they use resources efficiently. For example, local planning and zoning requirements for residential, commercial, and industrial development should reflect broader regional watershed conditions and management priorities. Many local governments already consider water quality issues in planning, but they should increase and broaden these efforts. State and federal governments should encourage local efforts with education campaigns and financial incentives.

States and tribes should continue to update and refine their comprehensive watershed assessments. Revised assessments could consider watersheds at smaller scales that would be more useful for local watershed efforts. State and federal governments should use these improved assessments to coordinate funding and technical assistance. Coordination of protection and restoration activities will maximize their efficiency.

Funding and Technical Assistance

Recommendations

Increase financial and technical assistance from all sources to watershed protection and restoration efforts

Increase program flexibility to address high priority needs:

- Re-evaluate funding needs and funding programs to ensure that programs sustainably support areas of greatest need
- Expand funding eligibilities
- Relax grant-matching requirements for selected assistance recipients

Expand citizen knowledge and understanding of watershed funding and technical assistance tools:

- Develop an internet-based clearinghouse of watershed assistance tools
- Develop education campaigns that inform watershed groups about financial and technical assistance tools

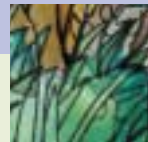
Discussion

Participants at the Regional Watershed Roundtables suggested that existing watershed management assistance programs are insufficient. In particular, participants suggested that federal and state governments should increase their financial and technical assistance to watershed management efforts. Assistance programs should also add field staff to work with private landowners and managers to make on-the-ground improvements.

Watershed practitioners suggest that government funding and technical assistance programs should support high priority activities. Governments should expand program eligibilities or develop new programs to support chronically under-funded needs such as watershed monitoring and research, staffing, and project evaluation and maintenance. Since watershed implementation projects often require long-term efforts, they require sustainable sources of funding. Grant programs should ease match requirements for smaller projects or for nonprofit organizations with limited capital.

Watershed practitioners recommend that technical assistance programs expand their use of on-the-ground partnerships that teach landowners about best management practices and water efficiency techniques and assist landowners with their implementation. Because watersheds cannot be restored without the participation of private landowners, technical assistance programs will critically impact the success of governmental watershed efforts.

The federal government should furnish an internet-based clearinghouse to help watershed groups navigate an overwhelming number of public and private services and funding sources. A clearinghouse of this sort would also aid inter-agency coordination. Finally, the federal government should inform citizens and organizations about available watershed resources through educational campaigns.



Implementation

Recommendations

Pursue both watershed protection and restoration activities

Display patience and perseverance with implementation efforts:

- Recognize that successful implementation of watershed protection and restoration actions takes place over decades
- Ensure that watershed plans lead to action
- Follow up projects with appropriate monitoring, maintenance, and evaluation activities

Provide adequate enforcement of watershed laws and regulations

Incorporate the latest technologies to restore, protect, and monitor watershed health

Discussion

Watershed practitioners should implement actions that both protect and restore watersheds. Many local stakeholders recognize that protecting remaining undeveloped watershed areas is preferable to restoring degraded areas. Federal agencies with competing authorities and legislative mandates will need to cooperate with each other to balance protection and restoration efforts.

Project implementers should exercise both patience and perseverance. Watershed protection and restoration programs often gain momentum slowly. However, watershed plans must eventually lead to action. Watershed practitioners should also maintain restoration projects appropriately to retain environmental gains.

Governments should provide adequate resources to their programs for effective implementation. Watershed management programs should be able to provide reasonable deterrents against activities that adversely impact watershed health, decisive actions against violators, and efficient on-the-ground actions.

What Can be Done to Improve Progress?

Evaluation

Recommendations

Establish science-based indicators for watershed programs and projects:

- Improve indicators for chemical, physical, and biological properties of watersheds
- Incorporate outcome-oriented measures into assistance programs—and provide funds for evaluating these measures
- Fund research to evaluate varying treatment and restoration techniques
- Develop common federal indicators for assessing watershed health and common measures for tracking and reporting performance

Measure results against established goals


Make results widely available to watershed practitioners:

- Track results at local, regional, and national watershed scales
- Post results on the internet

Discussion

The complexity of watershed approaches has limited objective and empirical evaluations of success or failure. Watershed protection and restoration efforts often involve many scientific and social issues that practitioners can only assess in a subjective and piecemeal fashion. At the same time, many functional watersheds need immediate protection and many degraded watersheds need immediate restoration. Therefore, watershed practitioners should learn as much they can from their actions, and these lessons should inform future actions.

Watershed projects and programs should develop and use indicators that reflect resource-level changes—quantifiable chemical, physical, or biological results. Federal agencies should establish common watershed health indicators and track and report performance of both projects and programs. For an effort like this to be successful, individual projects must track results against established goals and



government programs must keep better inventories of these watershed restoration projects. Federal agencies should require that applicants for federal assistance establish quantifiable resource-level goals. Governments should also provide financial support for the monitoring and measurement of project results.

Governments should track results with databases that cross agency and political borders. These databases should consider watershed progress at many scales and should be accessible via the internet.